Balanced and Unbalanced Forces Answer Page

1.Two tugboats are moving a barge. Tugboat A exerts a force of 3000 newtons on the barge. Tugboat B exerts a force of 5000 newtons in the same direction. What is the combined force on the barge?

ANSWER: 8000 newtons

2.Draw arrows showing the individual and combined forces of the tugboats in #1.

ANSWER: ------> + ----------> = ---------->

3.Now suppose that Tugboat A exerts a force of 2000 newtons on the barge and Tugboat B exerts a force of 4000 newtons in the opposite direction. What is the combined force on the barge?

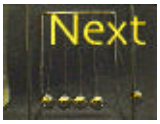
ANSWER: 2000 newtons (in the direction of Tugboat B)

4.Draw arrows showing the individual and combined forces of the tugboats in #3.

ANSWER: ----> + <-------->

5.Could there ever be a case when Tugboat A and Tugboat B are both exerting a force on the barge but the barge doesn't move? Draw arrows showing the individual and combined forces in such a situation.

ANSWER: Yes, if the forces are balanced. --------> + <-------- **(combined force equals zero.**



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